

A large, stylized letter 'A' is formed using the characters 'S' and 'Y'. The 'S' characters are arranged in a grid-like pattern to form the left and right sides of the letter, while 'Y' characters form the central vertical stem and the horizontal crossbar. The overall shape is a bold, blocky 'A' that fills most of the page.

SWA
VO4

```

LLIIIIIISSSSSSSS
LLIIIIIISSSSSSSS
LLIIIIIISSSSSSSS
LLIIIIIISSSSSSSS
LLIIIIIISSSSSSSS
LLIIIIIISSSSSSSS
LLIIIIIISSSSSSSS
LLIIIIIISSSSSSSS
LLIIIIIISSSSSSSS
LLIIIIIISSSSSSSS
LLLLLLLLLLLLIIIIIISSSSSSSS
LLLLLLLLLLLLIIIIIISSSSSSSS

```


SVAPTE
Table of contents

- SYSTEM VIRTUAL ADDRESS OF PAGE TABLE E 16-SEP-1984 01:18:49 VAX/VMS Macro V04-00

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HISTORY ; DETAILED
DECLARATIONS
SVAPTECHK - SYSTEM VIRTUAL ADDRESS OF PAGE TABLE ENTRY
PTEADR, PTEINDX - PAGE TABLE ENTRY ADDRESS OR INDEX

SWA
V04


```
0000 1 .TITLE SVAPTE - SYSTEM VIRTUAL ADDRESS OF PAGE TABLE ENTRY
0000 2 .IDENT 'V04-000'
0000 3
0000 4 *****
0000 5
0000 6 *
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0000 24 *
0000 25 *****
0000 26
0000 27 ++
0000 28 FACILITY: EXECUTIVE, MEMORY MANAGEMENT SUBROUTINES
0000 29
0000 30 ABSTRACT: GIVEN A VIRTUAL ADDRESS (PROCESS OR SYSTEM),
0000 31 RETURN THE SYSTEM VIRTUAL ADDRESS OF ITS ASSOCIATED PAGE TABLE ENTRY.
0000 32
0000 33 ENVIRONMENT: KERNEL MODE, NO INTERLOCK REQUIRED
0000 34
0000 35 --
0000 36
0000 37 .PAGE
0000 38 .SBTTL HISTORY ; DETAILED
0000 39
0000 40 AUTHOR: PETER H. LIPMAN , CREATION DATE: 14-SEP-76
0000 41
0000 42 MODIFIED BY:
0000 43
0000 44 V03-001 WMC0001 Wayne Cardoza 02-MAY-1984
0000 45 Don't allow change to working set in PTEREF.
0000 46
```



```

0000 48      .SBTTL  DECLARATIONS
0000 49
0000 50 :
0000 51 : INCLUDE FILES:
0000 52 :
0000 53      $IPLDEF      ;PROCESSOR PRIORITY LEVEL DEFINITIONS
0000 54      $PCBDEF     ;DEFINE PROCESS CONTROL BLOCK OFFSETS
0000 55      $PHDDEF     ;DEFINE PROCESS HEADER OFFSETS
0000 56      $PRDEF      ;PROCESSOR REGISTER DEFINITIONS
0000 57      $SSDEF      ;SYSTEM STATUS CODES
0000 58      $VADEF      ;VIRTUAL ADDRESS VIELDS
0000 59 :
0000 60 : EXTERNAL SYMBOLS:
0000 61 :
0000 62 :
0000 63 :
0000 64 : MACROS:
0000 65 :
0000 66 :
0000 67 :
0000 68 : EQUATED SYMBOLS:
0000 69 :
0000 70 :
0000 71 : OWN STORAGE:
0000 72 :
0000 73 :
0000 74 : *****
0000 75 : *****
0000 76 : ***** THIS ENTIRE MODULE MUST BE RESIDENT *****
0000 77 : *****
0000 78      .PSECT  $MMGCOD
0000 79 :
0000 80 : *****
0000 81 :

```



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0000 83 .SBTTL SVAPTECHK - SYSTEM VIRTUAL ADDRESS OF PAGE TABLE ENTRY
0000 84 :++
0000 85 : FUNCTIONAL DESCRIPTION:
0000 86 :
0000 87 : GIVEN A PROCESS OR SYSTEM VIRTUAL ADDRESS IN R2, RETURN THE
0000 88 : SYSTEM VIRTUAL ADDRESS OF THE CORRESPONDING PAGE TABLE ENTRY
0000 89 : IF THE ADDRESS IS OFF THE END OF ITS PAGE TABLE, BUGCHK
0000 90 :
0000 91 : CALLING SEQUENCE:
0000 92 :
0000 93 : BSBW MMG$SVAPTECHK
0000 94 :
0000 95 : INPUT PARAMETERS:
0000 96 :
0000 97 : R2 = VIRTUAL ADDRESS (P0, P1, OR SYSTEM SPACE)
0000 98 : R4 = PROCESS CONTROL BLOCK ADDRESS
0000 99 : R5 = PROCESS HEADER ADDRESS
0000 100 : IPL = SYNCH (TO AVOID HAVING PROCESS PAGE TABLE MOVE)
0000 101 :
0000 102 : IMPLICIT INPUTS:
0000 103 :
0000 104 : NONE
0000 105 :
0000 106 : OUTPUT PARAMETERS:
0000 107 :
0000 108 : R2 PRESERVED
0000 109 : R3 = SYSTEM VIRTUAL ADDRESS OF THE PAGE TABLE ENTRY
0000 110 :
0000 111 : IMPLICIT OUTPUTS:
0000 112 :
0000 113 : NONE
0000 114 :
0000 115 : COMPLETION CODES:
0000 116 :
0000 117 : NONE
0000 118 :
0000 119 : SIDE EFFECTS:
0000 120 :
0000 121 : NONE
0000 122 :
0000 123 : --
0000 124 MMG$SVAPTECHK::
15 52 1F E1 0000 125 BBC #31,R2,MMG$PTEADRCHK ;HANDLE PROCESS SPACE VIA PTEADRCHK
00000000'EF 52 D1 0004 126 CMPL R2,MMG$GL_FRESVA ;ADDRESS WITHIN PAGE TABLE?
53 52 15 09 1E 000B 127 BGEQU PTELENVIO- ;BRANCH IF NOT, LENGTH VIOLATION
53 0000'DF43 DE 000D 128 EXTZV #VAV VPB,#VAVS VPB,R2,R3 ;VIRTUAL PAGE NUMBER
05 0018 129 MOVAL @W^MMG$GL_SPTBASE[R3],R3 ;SYS VIRTUAL ADDRESS OF PTE
130 RSB

```



```
0019 132 .SBTTL PTEADR, PTEINDX - PAGE TABLE ENTRY ADDRESS OR INDEX
0019 133 :++
0019 134 : FUNCTIONAL DESCRIPTION:
0019 135 :
0019 136 : GIVEN A VIRTUAL ADDRESS (SYSTEM OR PROCESS), CALCULATE
0019 137 : 1) THE SYSTEM VIRTUAL ADDRESS OF THE PAGE TABLE ENTRY
0019 138 : OR
0019 139 : 2) THE LONG WORD INDEX FROM THE BASE OF THE PROCESS/SYSTEM
0019 140 : HEADER TO THE PAGE TABLE ENTRY
0019 141 :
0019 142 : CALLING SEQUENCE:
0019 143 :
0019 144 : BSBW MMG$PTEREF ;FAULT PTE, RETURN SYS VIRT ADR OF PTE
0019 145 : BSBW MMG$PTEADCHK ;RETURN IPL=SYNCH, R0 = SYSTEM STATUS
0019 146 : BSBW MMG$PTEADCHK ;RETURN SYSTEM VIRTUAL ADDRESS OF PTE
0019 147 : BSBW MMG$PTEINDX ;BUGCHK IF LENGTH VIOLATION
0019 148 : BSBW MMG$PTEINDX ;RETURN LONG WORD INDEX TO PTE
0019 149 : BSBW MMG$PTEINDXCHK ;R0 = SYSTEM STATUS CODE
0019 150 : BSBW MMG$PTEINDXCHK ;RETURN LONG WORD INDEX TO PTE
0019 151 : BSBW MMG$PTEINDXCHK ;BUGCHK IF LENGTH VIOLATION
0019 152 :
0019 153 : INPUT PARAMETERS:
0019 154 :
0019 155 : R2 = PROCESS VIRTUAL ADDRESS (P0 OR P1 SPACE)
0019 156 : R4 = PROCESS CONTROL BLOCK ADDRESS
0019 157 : R5 = PROCESS HEADER ADDRESS
0019 158 : THIS MAY BE EITHER THE SYSTEM SPACE OR P1 SPACE ADDRESS
0019 159 : OF THE PROCESS HEADER, BUT IF IT IS THE SYSTEM SPACE ADDRESS
0019 160 : THE CALLING IPL MUST BE AT SYNCH TO PREVENT SWAPPING
0019 161 : IPL LEQ SYNCH - IF REQUESTING THE ADDRESS OF THE PAGE TABLE ENTRY
0019 162 : OR IF THE SYSTEM SPACE ADDRESS OF THE PROCESS HEADER IS
0019 163 : SPECIFIED, IPL MUST BE AT SYNCH TO PREVENT SWAPPING
0019 164 :
0019 165 : OR
0019 166 :
0019 167 : R2 = SYSTEM SPACE VIRTUAL ADDRESS
0019 168 : R4 = SYSTEM PROCESS CONTROL BLOCK ADDRESS
0019 169 : R5 = SYSTEM ADDRESS (NO P1 SPACE EQUIVALENT) OF SYSTEM PROCESS HEADER
0019 170 : IPL NOT REQUIRED TO BE AT SYNCH SINCE THE SYSTEM PAGE TABLE IS
0019 171 : NOT EVER MOVED.
0019 172 :
0019 173 : IMPLICIT INPUTS:
0019 174 :
0019 175 : NONE
0019 176 :
0019 177 : OUTPUT PARAMETERS:
0019 178 :
0019 179 : R0 = SYSTEM STATUS CODE
0019 180 : R2 PRESERVED
0019 181 : R3 = SYSTEM VIRTUAL ADDRESS OF PAGE TABLE ENTRY OR LONG WORD
0019 182 : INDEX TO PAGE TABLE ENTRY ACCORDING TO THE ENTRY POINT
0019 183 :
0019 184 : IMPLICIT OUTPUTS:
0019 185 :
0019 186 : NONE
0019 187 :
0019 188 : COMPLETION CODES:
```


SVAPTE
V04-000

- SYSTEM VIRTUAL ADDRESS OF PAGE TABLE E 16-SEP-1984 01:18:49 VAX/VMS Macro V04-00
PTEADR, PTEINDX - PAGE TABLE ENTRY ADDRE 5-SEP-1984 03:48:09 [SYS.SRC]SVAPTE.MAR;1

Page 5
(3)

```
0019 189 :  
0019 190 : SSS_LENVI0 ;PAGE TABLE LENGTH VIOLATION  
0019 191 :  
0019 192 : SIDE EFFECTS:  
0019 193 :  
0019 194 : NONE  
0019 195 :  
0019 196 :--
```

SWA
V04

00'
00'

SF


```
0019 198 .ENABL LSB
0019 199
0019 200 MMG$PTEADCHK::
1A 32 10 0019 201 BSBB MMG$PTEINDX ;GET INDEX TO PAGE TABLE ENTRY
50 E8 001B 202 BLBS RO,20$ ;BRANCH IF GOT ONE
001E 203 PTELENVIO:
001E 204 BUG_CHECK PTELENVIO,FATAL ;UNEXPECTED PAGE TABLE LENGTH VIOLATION
0022 205
0022 206 MMG$PTEREF::
0022 207 BSBB MMG$PTEINDX ;GET INDEX TO PAGE TABLE ENTRY
12 36 29 10 0022 207 BSBB MMG$PTEINDX ;GET INDEX TO PAGE TABLE ENTRY
A5 16 50 E9 0024 208 BLBC RO,30$ ;BRANCH IF LENGTH VIOLATION
06 E2 0027 209 BBSS #PHD$V_NO WS CHNG,PHD$W-FLAGS(R5),40$ ;NO CHANGE TO WORKING SET ALLO
6C B443 D5 002C 210 TSTL @PCBSL-PHD(R4)[R3] ;FAULT THE PAGE TABLE IF NECESSARY
0030 211 SETIPL #IPL$_SYNCH ;AND THEN RAISE TO SYNCH
0033 212 ASSUME PHD$M_NO WS CHNG LE 255
36 A5 40 8F 8A 0033 213 BICB #PHD$M_NO WS CHNG,PHD$W-FLAGS(R5) ;BACK TO NORMAL
53 6C B443 DE 0038 214 20$: MOVAL @PCBSL-PHD(R4)[R3],R3 ;CONVERT INDEX TO SYSTEM VIRTUAL
003D 215 ;ADDRESS OF PAGE TABLE ENTRY
05 003D 216 30$: RSB
6C B443 D5 003E 217 40$: TSTL @PCBSL-PHD(R4)[R3] ;FAULT THE PAGE TABLE IF NECESSARY
F1 11 0042 218 40$: SETIPL #IPL$_SYNCH ;AND THEN RAISE TO SYNCH
0045 219 BRB 20$ ;LEAVE BIT SET
0047 220
0047 221 .DSABL LSB
0047 222
0047 223 MMG$PTEINDXCHK::
D2 04 10 0047 224 BSBB MMG$PTEINDX ;GET INDEX TO PAGE TABLE ENTRY
50 E9 0049 225 BLBC RO,PTELENVIO ;BUGCHK IF LENGTH VIOLATION
05 004C 226 RSB
004D 227
004D 228 MMG$PTEINDX::
53 52 50 01 3C 004D 229 MOVZWL #SS$ NORMAL,RO ;ASSUME SUCCESSFUL COMPLETION
16 09 EE 0050 230 EXTV #VASS_VPN,#VASS_VPN+1,R2,R3 ;SIGN EXTENDED VIRTUAL PAGE NUMBER
0055 231 ;INCLUDING P1 SPACE BIT
0055 232 BLSS 20$ ;BRANCH IF P1 SPACE
28 A5 52 D1 0057 233 CMPL R2,PHD$ _FREPOVA(R5) ;OFF THE END OF P0 (OR SYSTEM) SPACE?
06 52 20 1E 005B 234 BGEQU 30$ ;BRANCH IF YES, LENGTH VIOLATION
53 0000'CF C0 005D 235 BBS #31,R2,10$ ;BRANCH IF SYSTEM SPACE
7E 0000'CF 1E 9C 0061 236 ADDL W^SGN$GL-PHDLCNT,R3 ;ADD OFFSET FROM PHD TO POPT
53 8E C0 0066 237 RSB
0067 238 10$: ROTL #<32-2>,W^MMG$GL_SYSPHDLN,-(SP) ;ADD OFFSET FROM SYSPHD
006D 239 ADDL (SP)+,R3 ;TO SYSP
0070 240 RSB
0071 241
0071 242 ; P1 SPACE VIRTUAL ADDRESS
0071 243
0071 244 20$: CMPL R2,PHD$ _FREPIVA(R5) ;OFF THE END OF P1 SPACE?
30 A5 52 D1 0071 245 BLEQU 30$ ;BRANCH IF YES, LENGTH VIOLATION
53 0000'CF C0 0077 246 ADDL W^SGN$GL_P1LCNT,R3 ;ADD OFFSET FROM PHD
007C 247 ;TO LAST + 1 ENTRY OFF END OF P1PT
05 007C 248 RSB
50 018C 8F 3C 007D 249 MOVZWL #SS$_LENVIO,RO ;LENGTH VIOLATION STATUS
05 0082 250 RSB
0083 251
0083 252
0083 253
0083 254 .END
```


SVAPTE
Symbol table

BUGS_PTELENVIO	*****	X	02
IPL\$-SYNCH	= 00000008		
MMG\$GL-FRESVA	*****	X	02
MMG\$GL-SPTBASE	*****	X	02
MMG\$GL-SYSPHDLN	*****	X	02
MMG\$PTEADCHK	00000019	RG	02
MMG\$PTEINDX	00000040	RG	02
MMG\$PTEINDXCHK	00000047	RG	02
MMG\$PTEREF	00000022	RG	02
MMG\$SVAPTECHK	00000000	RG	02
PCBSL-PHD	= 0000006C		
PHDSL-FREPOVA	= 00000028		
PHDSL-FREP1VA	= 00000030		
PHDSM-NO-WS-CHNG	= 00000040		
PHDSV-NO-WS-CHNG	= 00000006		
PHDSW-FLAGS	= 00000036		
PR\$-IPL	= 00000012		
PTE\$ENVIO	0000001E	R	02
SGN\$GL-P1LWCNT	*****	X	02
SGN\$GL-PHDLWCNT	*****	X	02
SS\$-LENVIO	= 0000018C		
SS\$-NORMAL	= 00000001		
VAS\$-VPN	= 00000015		
VASV-VPN	= 00000009		

+-----+
! Psect synopsis !
+-----+

PSECT name	Allocation	PSECT No.	Attributes														
.ABS	00000000 (0.)	00 (0.)	NOPIC	USR	CON	ABS	LCL	NOSHR	NOEXE	NORD	NOWRT	NOVEC	BYTE				
\$ABSS	00000000 (0.)	01 (1.)	NOPIC	USR	CON	ABS	LCL	NOSHR	EXE	RD	WRT	NOVEC	BYTE				
\$MMGCOD	00000083 (131.)	02 (2.)	NOPIC	USR	CON	REL	LCL	NOSHR	EXE	RD	WRT	NOVEC	BYTE				

+-----+
! Performance indicators !
+-----+

Phase	Page faults	CPU Time	Elapsed Time
-----	-----	-----	-----
Initialization	30	00:00:00.07	00:00:00.39
Command processing	105	00:00:00.52	00:00:04.66
Pass 1	258	00:00:07.11	00:00:27.45
Symbol table sort	0	00:00:01.24	00:00:03.31
Pass 2	61	00:00:01.30	00:00:05.64
Symbol table output	5	00:00:00.05	00:00:00.05
Psect synopsis output	1	00:00:00.02	00:00:00.02
Cross-reference output	0	00:00:00.00	00:00:00.00
Assembler run totals	462	00:00:10.31	00:00:41.53

The working set limit was 1200 pages.
39410 bytes (77 pages) of virtual memory were used to buffer the intermediate code.
There were 40 pages of symbol table space allocated to hold 776 non-local and 6 local symbols.
254 source lines were read in Pass 1, producing 13 object records in Pass 2.
16 pages of virtual memory were used to define 15 macros.

+-----+
! Macro library statistics !
+-----+

Macro library name	Macros defined
-----	-----
\$255\$DUA28:[SYS.OBJ]LIB.MLB;1	6
\$255\$DUA28:[SYSLIB]STARLET.MLB;2	6
TOTALS (all libraries)	12

864 GETS were required to define 12 macros.

There were no errors, warnings or information messages.

MACRO/LIS=LIS\$:SVAPTE/OBJ=OBJ\$:SVAPTE MSRC\$:SVAPTE/UPDATE=(ENH\$:SVAPTE)+EXECMLS/LIB

0381 AH-BT13A-SE
VAX/VMS V4.0

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